

User Defined Subs and Functions

A user defined function called DiceFunc:

```
Private Function DiceFunc(ByVal lowNum As Single, ByVal highNum As Single) As Single
Dim rndNum As Single
'diceroll = lo + int(rnd*(high-low+1))
rndNum = lowNum + Int(Rnd * (highNum - lowNum + 1))
'Assign the result to the function name
DiceFunc = rndNum
End Function
```

```
Private Sub CmdFunc_Click()
Dim low As Single 'low roll on the die INPUT
Dim high As Single 'high roll on the die INPUT
Dim roll As Single 'roll result of the die OUTPUT

'input
low = Val(txtNum1.Text)
high = Val(txtNum2.Text)

'calculation
roll = DiceFunc(low, high)

'output
MsgBox ("FUNCTION RESULT " + Str(roll))
End Sub
```

This is a sub which uses this function

In this example, notice that to use a function, you must use it within a statement.

In the function, the function name (DiceFunc) takes on the value that you wish to return to the user.

In the function, parameters (dummy variables) are passed ByVal.

The parameters (dummy variables) do not have to have the same name as the actual variables passed to the function, but they have to be the same type:

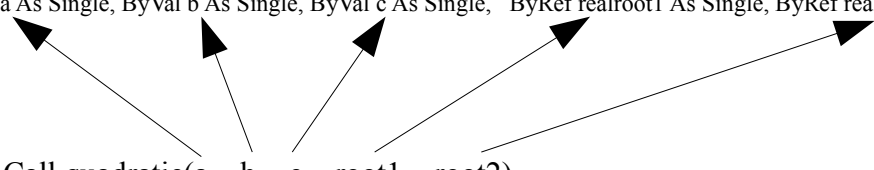
- Parameters lowNum, highNum (these are type single)
- Actual variables low, high (these are type single)

In this example, we have a sub which passes the input variables as value parameters (ByVal) and the output variables as reference parameters (ByRef).

```
Private Sub quadratic(ByVal a As Single, ByVal b As Single, ByVal c As Single, _  
    ByRef realroot1 As Single, ByRef realroot2 As Single)  
    'input parameters are passed ByVal  
    'output parameters (the answers) are passed ByRef  
  
    Dim discrim As Single  
  
    discrim = b * b - 4 * a * c  
  
    If discrim >= 0 Then ' real roots  
        realroot1 = (-b + discrim) / (2 * a)  
        realroot2 = (-b - discrim) / (2 * a)  
    Else  
        MsgBox ("ERROR! Complex roots!")  
    End If  
  
End Sub
```

```
Private Sub CmdCalc_Click()  
    'variables  
    Dim a As Single 'input  
    Dim b As Single 'input  
    Dim c As Single 'input  
    Dim root1 As Single 'output  
    Dim root2 As Single 'output  
    'input  
    a = Val(txtA.Text)  
    b = Val(txtB.Text)  
    c = Val(txtC.Text)  
  
    'calculation - to be done by a user defined sub  
    Call quadratic(a, b, c, root1, root2)  
  
    'output  
    lblRoots.Caption = "The roots are " & Str(root1) & " and " & Str(root2)  
  
End Sub
```

```
Private Sub quadratic(ByVal a As Single, ByVal b As Single, ByVal c As Single, ByRef realroot1 As Single, ByRef realroot2 As Single)
```



Call quadratic(a, b, c, root1, root2)

To use a sub, you must use the keyword Call.

Notice how the actual variables (a, b, c, root1, root2) match the dummy variables (a, b, c, realroot1, realroot2).

We use a sub instead of a function because we need to return two values. A function only returns one value.